

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

for the

Extension of the servitude road on the farms
Buffelsfontein 465 JQ and Modderspruit 641 JQ
near Mooinooi

Submitted to:

NORTH WEST PROVINCIAL GOVERNMENT:
DEPARTMENT OF ECONOMIC DEVELOPMENT,
ENVIRONMENT, CONSERVATION AND TOURISM.

July 2012

Submitted by:



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International Ferro Metals (SA) (Pty) Ltd:
 Draft Environmental Management Programme – Road Extension

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Draft Environmental Management Programme – Road Extension

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1 BACKGROUND INFORMATION

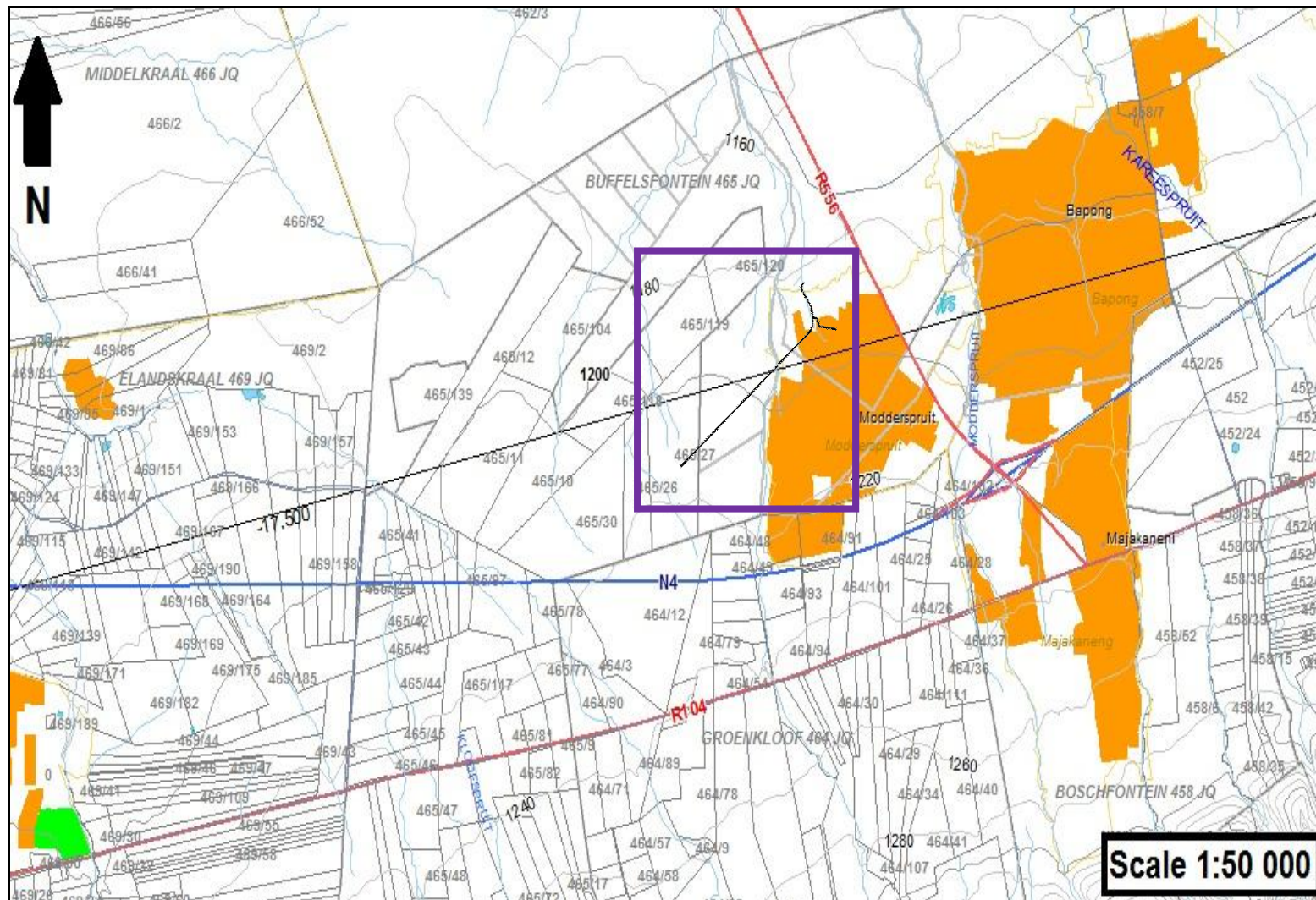
1.1 Property Details

The proposed site is located on portions 118, 119, 120 and 128 of the Farm Buffelsfontein 465-JQ as well as the farm Modderspruit 461 JQ, approximately 10 km from Mooinooi, North West Province.

International Ferro Metals (SA) (Pty) Ltd ("IFMSA") falls under the jurisdiction of the Bojanala Platinum District Council and the Madibeng Local Municipality (former Brits Municipality).

The servitude in question is owned by International Ferro Metals (SA) (Pty) Ltd. The various properties ownership is as follows:

Farm	Portion	Landowner	Contact Person	Postal Address
Modderspruit 461 JQ		The Bapo Ba Mogale Tribe	Minister of Rural Development and Land Reform	Private Bag X833, Pretoria, 0001
Buffelsfontein 465 JQ	118,119, 120, 128	Samancor Chrome Limited	Heather Fleming	P.O. Box 245, Millsell, 0325



There are three settlements, Modderspruit/Tornado, Bapong and Majakaneng, to the south and south-east of the site.

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1.2 Particulars of Environmental Assessment Practitioner

Prescali Environmental Consultants (Pty) Ltd, as independent environmental managers and impact assessors, has been appointed by IFMSA to facilitate the Integrated Environmental Management (IEM) procedure for the proposed extension of their access road, located just outside Mooiooi in the Madibeng Local Municipality in the North West Province.

Prescali Environmental Consultants (Pty) Ltd is experienced in environmental management and assessment and is familiar with the Environmental Management requirements for projects. The company is well-known for its integrity, independence and skill in assisting interested and affected parties to participate in the EIA process. Prescali Environmental Consultants (Pty) Ltd has no vested interest in the proposed project.

As per the requirements of the National Environmental Management Act: NEMA, 1998 (Act No. 107 of 1998), ("NEMA") as amended and the Environmental Impact Assessment Regulations, 2006 the following information is pertinent with regards to the Environmental Assessment Practitioner ("EAP") that has conducted the necessary studies and investigations for the proposed development:

Environmental Consultants: Prescali Environmental Consultants (Pty) Ltd
Postal address: P.O. Box 2544, Montana Park, 0159
Telephone: 012 543 3808
Fax: 086 621 0294

Author: Elaine van der Linde (*Pr.Sci.Nat*)
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Ms. van der Linde has qualifications in Geology, Engineering Geology and Environmental Management and experience in Water and environmental management and has been employed by:

- Department: Water Affairs and Forestry (DWAF)
- Groundwater Consulting Services cc
- M2 Environmental Connections cc
- Prescali Environmental Consultants (Pty) Ltd

She has 12 years of applicable experience.

Professional affiliation(s):

- The Geological Society of South Africa
- South Africa Council for Natural Scientific Professions.
- S.A. Institute for Engineering and Environmental Geologists
- Ground Water Division of the Geological Society of South Africa
- International Association for Impact Assessment (South Africa)

2 DETAILED DESCRIPTION OF PROPOSED PROJECT AND INFRASTRUCTURE

The purpose of the proposed project is to extend and formalize the existing servitude road in order to connect the road D2170 to roads D345 and R556. Due to the upgrade of the N4 highway, access to the properties on the farm Buffelsfontein will be constrained. The upgrade and extension of the said road will take place on portions 118, 119, 120 & 128 of the farm Buffelsfontein 465 JQ as well as the farm Modderspruit 461 JQ located within the jurisdiction of the Madibeng Local Municipality. In addition, this road will minimize the movement of heavy vehicle loads through the local community of Bapong, Modderspruit and Majakaneng. .

The details of the application are as follows:

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (“NEMA”) an application for an environmental authorization will be undertaken for the following activities in terms of Listing Notice 1 (GN No. R. 544 of June 2010):

- Listed Activity 47 – Extension and formalizing of an existing servitude road (14m reserve) in order to connect the Roads D2170 with D345 and R556; and
- Listed Activity 11 – Construction of various river crossings along the proposed expansion route.

3 PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT (EMPr)

It is understood that any development can pose various risks to the environment as well as the inhabitants of the surrounding area/s. The risks should be taken into account during the planning phase of the development. The purpose of this EMPr is to provide management responses that will ensure that the impacts of the new development are minimised. This EMPr is, therefore, a stand-alone document, which must be used on the site during each phase of the development (planning, construction and operational).

This document should be flexible so as to allow the contractor and Owner to conform to the management commitments without being prescriptive. If implemented consistently, the management commitments will ensure that the anticipated environmental risks are minimized. It is the responsibility of the applicant (IFMSA) and associated contractors and subcontractors to comply with the requirements of this EMP. Any parties responsible for transgression of the underlying management measures outlined in this document will be held liable for non-compliances and will be dealt with accordingly.

This EMPr is submitted as an addendum to the Basic Assessment Report ("BAR"). This EMPr will be amended according to any conditions and specific requirements as stipulated by the Record of Decision (RoD).

This EMPr and its management guidelines have been formulated with the holistic view of minimising any potential indirect impacts to the habitat and adjoining properties. It should be used on site during construction, and is binding on all contractors.

4 KEY ISSUES

Risks and key issues were identified and addressed through an internal process based on similar developments, an environmental impact assessment and a site visit.

The risks and key issues identified include:

Planning and Design	Construction Phase	Operational Phase
<i>Direct Impacts</i>		
<ul style="list-style-type: none"> No direct impacts will be incurred during the planning and design phase 	<ul style="list-style-type: none"> Crime, Safety and Security Dust Increased potential for erosion on-site Increased run-off Noise Increased traffic impact Job creation Solid waste accumulation 	<ul style="list-style-type: none"> Increased potential for erosion on-site Increased run-off
<i>Indirect Impacts</i>		
<ul style="list-style-type: none"> No indirect impacts will be incurred during the planning and design phase 	<ul style="list-style-type: none"> Increased flow to stream(s) Increased potential for crime Visual impact Waste Impact 	<ul style="list-style-type: none"> Increased flow to the stream(s) Increased traffic and potential for accidents Increase in ecological footprint Visual impact
<i>Cumulative Impacts</i>		
<ul style="list-style-type: none"> No cumulative impacts will be incurred during the planning and design phase 	<ul style="list-style-type: none"> The bulk of the impacts during this phase will have immediate effect (eg. The noise-, dust- and water pollution). If the site is monitored on a continual basis during this phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental 	<ul style="list-style-type: none"> No cumulative impacts will be incurred during the operational phase

	management from the mine.	
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5 PHASES OF THE ROJECT

The process, which was followed, is in compliance with the EIA Regulations (GNR543, 544, 545, 546 and 547) published on 18 June 2010 as promulgated in terms of the National Environmental Management Act, 1998 (Act No. 108 of 1998), and applies the principle of Integrated Environmental Management ("IEM"). The purpose of this EMPr is to formulate mitigation measures that should be made binding to all contractors during construction as well as measures that should be implemented during the operational phase. The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. This should limit corrective measures needed during the construction and operational phases of the proposed development. Additional mitigation will be included throughout the project's various phases as necessary. This EMPr addresses the following four phases of the development:

- Planning and Design
- Construction Phase
- Operational Phase

5.1 Planning and Design Phase

The planning phase is complete and provided an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimize the chance of impacts taking place. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

5.2 Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise and dust pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the Owner of the site, the owner of the infrastructure and the occupier of the site.

5.3 Operational Phase including undertaking of the activity

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete. Monitoring of certain sensitive issues such as water quality and the general state of the water resources will still be required.

6 RESPONSIBILITIES

The roles of the responsible people on site are included below:

The Applicant is the ultimate responsible party for the development and all aspects and phases hereof. The Applicant or an appointed representative must communicate all issues raised in this EMPr with all personnel undertaking any work on the site. Should any non-compliance with this EMPr take place, The Applicant will ultimately be held liable. The Applicant should include the EMPr as a specific condition within any contract that is to be signed between him/her and any other party involved in the construction of the development. The Applicant is responsible for identifying which local/provincial environmental authority has jurisdiction over the project.

The Contractor is responsible for complying with the EMPr during the construction phase of the development. The Contractor is responsible for ensuring that his/her contractors, employees and sub-contractors appointed by him/her are familiar with the EMPr and that they abide by it. The Contractor will be responsible for any non-compliance with the EMPr and will pay for any remedial work that may result from non-compliance resulting directly from his/her negligence.

The ECO is responsible for communicating environmental issues associated with the site to the Contractor and the Applicant. Should any non-compliance with the EMP take place, the ECO must communicate this with the party responsible for the non-compliance as well as the Contractor and the Applicant. If the non-compliance continues after written request by the ECO to rectify the situation, the ECO must inform the local/provincial/national environmental authority in writing. The ECO is responsible for the explanation of environmental issues contained in this EMPr to anyone working on the site. Should any issues arise on the site of an environmental nature or concern, the ECO will be responsible for taking the appropriate action.

The CLO (Community Liaison Officer) is responsible for communicating any issues or concerns of the surrounding community regarding the development to the Applicant, or other responsible party and visa-versa.

The Competent environmental authority is responsible for taking action against any non-compliance with the EMPr by the Applicant, the Contractor or any of his/her subcontractors. Authorisation in the form of an Environmental Authorisation is required from the relevant office of the Department of Environmental Affairs based on the application and basic assessment documents submitted. From the Environmental Authorisation will flow site specific requirements that will align the EMPr and the intended activity. The competent authority can request a compliance audit to be undertaken on the site at any time during the development phase of the project.

7 ENVIRONMENTAL MANAGEMENT PROGRAMME

The following tables form the core of this EMPr for the planning, construction, operational and decommissioning phases of this development. This table should be used as a checklist on site during each phase of the development.

Table 1: Environmental Management Programme (General issues and Planning phase)

ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
General	This EMPr must be made binding to the main contractor as well as individual sub-contractors and should be included in the tender documentation of the construction contract.	Applicant, Contractors, ECO	Once-off
	This EMPr does not absolve the Applicant/contractors from complying with any other relevant legislation.		Continuous
	Approval must be obtained from DWA for any activities that require authorisation in terms of Sections 39 and 40 of the National Water Act, 1998 (Act No 36 of 1998).	Applicant, Contractors	Once-off
Appointment and Duties	The Applicant / Appointed contractors must ensure that an Environmental Control Officer (ECO) is appointed who must monitor the contractor's compliance with the Environmental Management Programme for the duration of the construction period.	Applicant, Contractors	Once-off
	The Applicant must provide the contractors with a copy of the EMPr.		
	The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	ECO	Continuous
	The ECO must form part of the project management team and attend all project meeting or as required.		
	The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.		
Job Creation and Skills Transfer	Employment of local people should be encouraged for the planning and design of the facilities and adequate training and education of these people ensured.	Applicant, Contractors	Continuous
Erosion/ Siltation	Construction should be planned to minimise environmental impacts. Failing this, additional measures should be taken to ensure that possible environmental damage is minimised.	Contractors, ECO	Once-off
	In the event of erosion occurring on site, the contractor must implement measures to reduce the potential for erosion and siltation before construction start in the form of silt traps and water clarifier treatments etc. Restorative repairs should be planned to include the backfilling and consolidation of eroded areas.		
	Areas in which construction will take place must be demarcated before construction start.		Continuous
	Keep the size of the area of the construction footprint to a minimum by constructing boundaries and demarcated areas thus reducing the area infringement of the development on the natural habitat.		
	Existing roads and services must be utilised as far as possible thus reducing the area		

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
	infringement of the development on the natural habitat.		
Impact on sensitive natural habitat	The extent of the construction site should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the construction site that are not part of the demarcated developmental area should be considered as “no-go” areas for employees, machinery or even visitors. The “no-go” area is the 30 meter buffer zone from the perimeter of the construction site.	Applicant, Contractors	Once-off
	Keep the size of the area of the construction footprint to a minimum by constructing boundaries and demarcated areas thus reducing the area infringement of the development on the natural habitat.	Applicant, Contractors	Continuous
Construction generated waste	All contracts with subcontractors should contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMPr.	Contractors, ECO	Once-off
Storm water	Storm water on the site must be managed, including measures to ensure that the energy of storm water that is to be released into the drainage areas is dissipated. Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion.	Contractors	Once-off
Visual and Aesthetic Impact	Design infrastructure to blend in with the surroundings and use materials that blend in.	Applicant, Contractors	Once-off
	The height of the infrastructure must be limited as far as possible.	Contractors	Once-off
Traffic impact	Pro-active planning with reference to the undertaking of the construction activities at site as construction vehicles will contribute towards increased traffic on the entrance road.	Contractors	Once-off or as necessary
Safety and Health	The site and crew are to be managed in strict accordance with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996), Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National building regulations.	Contractors	Continuous
Security	The contractor must supply his own security arrangements for the construction area. No construction workers are allowed on site after hours, except for a designated security officer.	Contractor	Monitor daily
	The project programme and phases as well as contact details and responsible individuals should be available to surrounding residents, at all times during construction.		
Social/ Existing Services	All agreement made with the Local Municipality need to be adhered to. All necessary approvals need to be obtained before commencement of construction.	Applicant, Contractors	As necessary

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
Public Participation and Labour	Employment of local labour, from the surrounding communities and the implementation of training is to be instituted during the time period of the project.	Applicant, Contractors	At project initiation, and as necessary.
	Residents within the vicinity of the project will be informed and kept informed of any construction dates.		
Environmental impacts of site establishment	The working area of the construction site shall be agreed on between the Consulting Engineer, ECO and the Contractor.	Contractors, ECO	At project initiation and as work progresses, as necessary
	Prior to establishment of the work area, the Contractors shall produce a site establishment plan showing the positions of the following for approval by the ECO: <ul style="list-style-type: none"> • No-go areas; • Demarcated construction areas; • All construction material and equipment lay-down yards; • Refuse and kitchen areas; • Spoil sites; and • Temporary stockpiles sites for topsoil intended for reuse. 		
Environmental incidents	The contractor must take corrective action to mitigate any incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves.	ECO, Contractor	Continuous
	Any non-compliance with any of the measures stipulated in this EMPr must result in the penalties being issued to the transgressor. This must be included in the contract for any construction work.	Applicant, Contractors	
Emergency Preparedness	If chemicals in sufficient quantity and toxicity have the potential to be released into any watercourse, emergency contingency plans should be prepared as safety measures. These safety measures should be communicated with the relevant personnel on the construction site.	Applicant, ECO	Once-off
Infrastructure	Infrastructure should be robust and designed to prevent spillages of raw or partially treated sewage.	Applicant	Continuous
	Ponds and dirty water channels should be properly lined.		
	The location and sizing of the sewer system and manholes must ensure that no surface water ingress into the reticulation system.		
	The integrity of the maturation ponds will be maintained to prevent spillages, leaks and seepage from the impoundment to the natural water resource.	Applicant, Contractors	
	The storm water and sewer reticulation system will be kept free from obstructions to	Applicant,	

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
	ensure that their efficiency is not rendered negatively as well as to prevent accidental spillages of raw sewerage into the environment.	Contractors	
	The water pollution control management facilities such as the reed beds and sludge handling facilities will be operated in such a way as to ensure that the available capacity and freeboard requirements as depicted in terms of regulatory requirements are adhere to at all times.	Applicant, Contractors	

Table 2: Environmental Management Programme for the Construction Phase

ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
General	General good construction and best industry practices should be employed to avoid adverse environmental impacts.	Contractors, ECO	Monitor daily or as necessary
	Only designated construction areas should be cleared.		
	All persons employed by the contractors and sub-contractors shall abide by the requirements of the general environmental protection specifications.		
	The onus is on the contractor to ensure that the workforce is aware of and conforms to the environmental guidelines that are applicable to the project.		
	Construction equipment may not move outside the area defined as the site.		
	Labour should be recruited from the local communities, where practicable.		
	The labour force should be trained in the necessary skills for the project, if necessary.		
General	On Completion of Works, the Contractor shall clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, rubbish and temporary works of every kind. Areas thus cleared shall be graded and scarified to restore the ground to its original profile as near as practicable before topsoil placement.	Contractors, ECO	Continuous
	All persons employed by the Contractor or his subcontractors shall abide by the requirements of these General Environmental Protection Specifications.		
	Any employees of the Contractor or his subcontractors found to be in breach of any of the General Environmental Protection Specifications may be ordered by the ECO to leave the site forthwith. The order may be given verbal or in writing. Confirmation of a verbal order will be given as soon as practicable but lack of confirmation in writing shall not be a cause for the offender to remain on site. No extension of time will be granted for any delay or impediment to the Contractor brought about by a person ordered to leave the site.		

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
	Staying overnight on the campsite must be prohibited for all construction staff, apart from the on-site security. Mitigation measures as detailed in the Security section below are applicable to members of the workforce of the appointed contractors that stay overnight.		
Site establishment	Vegetation and trees to be retained shall not be damaged or felled.	Contractors, ECO	Once-off
	Care should be taken to adequately drain areas surrounding water points in order to avoid the development of pools of standing water, as tend to be a breeding source of flies, mosquitoes and other vectors.	Contractors, ECO	Continuous
	To minimise run-off, which can cause erosion and pollution down slope, these sites should not be placed on sloped areas. If not possible, sufficient berms should be installed to prevent erosion gullies from forming.		
	Provision for the removal of waste generated shall be made.		
	Sufficient rubbish disposal units should be made available for waste disposal.		
	Fires will only be allowed in facilities especially constructed for this purpose within the fenced demarcated area.	Contractors, ECO	As necessary
	Fires within the designated areas must be small in scale so as to prevent excessive smoke being released into the air.	Contractors, ECO	Daily
On completion of the works, the Contractor shall clear away and remove from the site all surplus materials and other fixtures, rubbish and temporary works of every kind.	Contractors, ECO	Site decommissioning	
“No-go areas” and the construction footprint	No-go areas must be demarcated with fencing, warning tape and signs before any construction activities or site preparation activities commence. These areas and the type of fencing/barrier must be approved by the ECO.	Contractors, Applicant, ECO	Once-off, Monitor
	Absolutely no land clearing, construction activities, vehicular traffic of any kind, pedestrian traffic, fires and any associated activity may occur beyond demarcated areas. Very strict control must be exercised over this aspect of construction activities.		
	Access roads must also be clearly demarcated so to stop construction vehicles taking unnecessary shortcuts, thereby expanding the construction footprint.		
	The breaking of trees for fires is strictly prohibited. The contractor must supply all necessary firewood.		
Provision of Water	Potable water should be supplied.	Contractors, ECO	As necessary
	Great care is to be taken that the water supply is not contaminated in any way.	Contractors, ECO	Once-off
Toilet Facilities and Waste Water	Adequate ablutions are to be supplied for workers.	Contractors, ECO	Monitor weekly
	Safe and effective sewage treatment will require one of the following sewage handling		

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
	<p>methods (i.e. dry composting toilets such as ‘enviro loos’, portable chemical toilets, which are supplied and maintained by the site contractor or existing infrastructure already present).</p> <p>Under no circumstances may ablutions occur outside of the provided facilities.</p> <p>Chemical toilets should be emptied regularly and the site contractor should supply toilet paper.</p> <p>Chemical toilets should be placed within easy access of the workforce, to ensure that the surrounding environment is not used for this purpose.</p> <p>Chemical toilets should be placed and anchored so that they do not blow over.</p> <p>Placement of chemical toilets should avoid the possibility of the area surrounding the toilet becoming flooded.</p>		(ECO=monthly)
Solid Waste Control and Litter	No littering by construction workers may be permitted. Any litter will be collected and removed off-site to a registered waste site.	ECO	Monitor weekly
	A weekly litter patrol of the entire site is to be conducted by the ECO. The necessary remedial action is to take place within 24-hours of the inspection by the upgrading crew.		
	Rubble and litter must be removed once a week or more often as the need arises from all areas of the construction site and disposed of at an approved dumping site as approved by the Council.	ECO, construction crew	As necessary
	Sufficient containers must be on the construction site to handle the amount of litter, wastes and rubbish debris and builders wastes generated on the site.	Contractors, ECO	Monitor daily
	Containers must be securely covered at all times and emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to surrounding habitats or adjacent properties.		
	No rubble or discarded building materials must remain on the construction site for more than two weeks.		
	All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site.	Contractors, ECO	As required
	Burning of waste is not allowed.	Contractors, ECO	Daily
	All refuse containers are to be covered at all times.		
The Contractor shall remove all waste and transport all such waste material off site to registered dump areas, which have been approved by the Consulting Engineer or ECO.	Contractors, ECO	Weekly (ECO=monthly)	
Spoil Sites	Should spoil sites be required, the locality, intended operation, maintenance and future rehabilitation methods for the spoil sites must be approved by the resident engineer and	Contractors, ECO,	As necessary

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
	the ECO any relevant landowner. Spoil sites may not be used for the disposal of hazardous or toxic waste.	Resident Engineer	
Construction Material Storage	A suitable and safe area for storage of the construction material is to be provided.	Contractor, ECO	As necessary
Concrete and Chemicals	<p>Concrete shall be mixed only in areas, which have been specially demarcated for this purpose and on mortar boards.</p> <p>Concrete and plaster mixing should take place in a designated area. This designated area should be bermed to prevent run-off from this area and in an area beyond the 1:100 flood line and outside 50 m of the identified wetland area.</p> <p>All concrete that is spilled outside these areas shall be promptly removed by the Contractor and taken to an approved dumpsite. Any spillage, which may occur, will be investigated and immediate remedial action shall be taken.</p> <p>Cleaning of cement mixing and handling equipment shall be done using proper cleaning trays, so as to avoid contamination of soils and groundwater.</p> <p>All empty containers shall be removed from the site for appropriate disposal at a licensed commercial facility. Absolutely no refuse shall be burnt on site.</p> <p>After all concrete mixing is complete; all waste concrete shall be removed from the batching area and disposed of at an approved dumpsite.</p> <p>Storm water shall not be allowed to flow through the batching area.</p>	Contractors, ECO	Monitor weekly Continuous, Monitor daily for high volumes of batching (ECO = monthly)
Fuel and chemical management	<p>Storage of potentially hazardous materials must be agreed with the ECO. These materials include fuel, oil, cement, bitumen etc.</p> <p>As a minimum, a walled concrete-platform, dedicated store with adequate flooring or lined bermed area must be used to store chemicals in their containers such as fuel, oil, paint, bitumen, herbicide and insecticides, as appropriate, to minimise infiltration of said chemicals into the soil.</p> <p>Fuel (if required) should be stored and maintained in a steel tank, supplied by the fuel suppliers. The fuel tanks shall be contained within a berm constructed of bricks and mortar, concrete or other appropriate impermeable material.</p> <p>The volume of the bermed area shall be of sufficient capacity to contain the full volume plus half of the fuel tanks in the event of spill.</p> <p>Drip trays (minimum of 10cm deep) are to be placed under all vehicles if they stand for more than two days.</p> <p>The surface area of the drip trays will be dependent on the vehicle and must be large</p>	Contractors, ECO	Continuous, monitor weekly (ECO = Monthly)

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	enough to catch any hydrocarbons that may leak from the vehicle while standing.		
	The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle.		
	Sufficient care must be taken when handling these materials to prevent pollution by spillage.		
	Surface water draining off contaminated areas containing oil and petrol are to be channelled into a sump.	Contractors, ECO	As necessary, monitor weekly
	Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste site.	Contractors	Continuous
	Soil contaminated by oil or other hazardous substances should be disposed of, at an approved waste dumpsite.		
	The Contractor shall educate workers on the proper method for cleaning fuel points so as to minimise fuel or oil being washed out of the demarcated areas.		
Landscaping	All areas affected by the construction works will need to be rehabilitated and re-vegetated. This includes temporary access roads, construction sites, workers sites, lay-down areas, etc.	Contractors, ECO	As necessary
	All areas affected by the construction works will need to be rehabilitated to ensure that surface water is free draining and does not pond.		
	Areas that require additional topsoil and seeding due to insufficient topsoil being stockpiled or due to contamination shall be re-instated at no additional cost to the Applicant by the Contractor on instruction from the Consulting Engineer or Environmental Control Officer.	Contractors	As necessary
Erosion/ Siltation	Construction should take place at the time most suitable to reduce impact on the environment. Failing this, additional measures should be taken to ensure that possible environmental damage is minimised.	Contractors, ECO	Once-off
	In the event of erosion occurring, the contractor must affect repairs timeously. Restorative repairs should include the backfilling and consolidation of eroded areas.		As necessary monitor weekly (ECO= monthly)
	No stockpiles or construction materials may be stored or placed within any drainage line on site, in close proximity to storm water drains or outside of the demarcated area. The temporary storage of topsoil, inert spoil, fill etc. should be above the 20 year flood line, at least 20 m from the top of the bank of any drainage lines, and 50 m from the identified wetland, whichever is the maximum or as agreed with the ECO.		Once-off, monitor
	To prevent erosion of material that is stockpiled for long periods, the material must be		

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	retained in a bermed area.		As necessary
	Stockpiles should not be higher than 2m to avoid compaction, and single handling is recommended.		
	The energy/ velocity of storm water run-off should be dissipated by use of metre drains at appropriate intervals.		
	All trenches and excavation works must be properly backfilled and compacted according to specifications given in sub-clause 5.2.4. of SABS 1200DA.		
	Where it is necessary to clear large areas, the clearing activities must be followed by the planting of grass (approved seed mixtures to be used), within two weeks.	Applicant, Contractors, ECO	As necessary
	Construct silt traps and water clarification treatment to prevent impacts on wetlands	Applicant, Contractors	As necessary
Soils	Soil stockpiles should be located in areas where it will not be impacted by external factors.	Applicant, Contractors, ECO	As necessary
	Vegetation on soil stockpiles should be encouraged.		
	Soils impacted outside the demarcated areas should be ripped and vegetation growth established.	Applicant, Contractors, ECO	As necessary
Visibility	Dust levels must be kept to a minimum by employing dust suppression techniques. In addition the construction area should be kept within the demarcated areas.	Contractors, ECO	As necessary
	Erosion control measures must be implemented to prevent visual impacts from erosion.	Contractors, ECO	As necessary
	Materials selected for construction must fit into the visual fabric of the area and existing infrastructure.	Applicant, Contractors	As necessary
	Shiny materials such as corrugated iron must be avoided	Applicant, Contractors	As necessary
Impacts on Vegetation	Clearance of indigenous vegetation must be kept to a minimum.	Contractors, ECO	Continuous
	No indigenous vegetation may be collected, or used for firewood.	Contractors, ECO	Continuous
	The access to the construction site should occur on disturbed areas or on existing roads.	Contractor, ECO	As required
	Any disturbance of the environment such as areas designated for the storage of bricks, mixing of concrete or collection of rubble must be restricted within this footprint and must be demarcated with warning tape so as no disturbance of any kind can occur outside of this area.	Contractors, ECO, Applicant	Monitor daily
	It is essential to implement a rehabilitation plan on cleared areas.		Once-off
	Construction activities should not result in the spread of alien invasive plant species.	Contractors, ECO, Applicant	Continuous

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
Impact on animal life	Under no circumstances shall any animals (wildlife and domestic animals) be handled, removed, killed or interfered with by the contractor, his employees, his sub-contractor or his employees.	Contractors, ECO	As necessary
	The Contractor shall advise his workers of the penalties associated with the needless destruction of wildlife, as set out in the Animals Protection Act (Act 71 of 1962) sec. 2 (fine R2 000 and/or 12 months imprisonment).		Once-off
	All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. Poaching is illegal and it should be a condition of employment that any employee caught poaching will be dismissed. Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem specimen e.g. a large snake a specialist should be called in to safely relocate the animal.	Contractors, ECO	Once-off
	The construction site must be kept clean and tidy and free from rubbish, which would attract animal pest species and increase degradation of surrounding faunal habitat.	Contractors	Once-off
Surface water management	The Contractor shall not use the land forming the site of, or connected with, the works for any purpose whatsoever other than for the proper carrying out of the works under the Contract and shall place any camps that may be required for himself and his employees only on sites approved by the ECO and consulting engineer.	Contractors, ECO	Monitor daily or as necessary
	No uncontrolled discharges from the site/working area to the watercourse shall be permitted. All discharge points will require approval. Discharges include concrete mixing, vehicle washing, etc.		
	At all times care should be taken not to contaminate surface water resources.		
	Preserve the water resources in line with the management objectives of the CMA/DWA for the management unit.		
	Ensure proper storm water management is in place, thus keep clean water clean and contain dirty water.		
Should water downstream of a spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the engineer. If liability is found to rest with the contractor, the costs of containment and rehabilitation shall be for the contractor's account, including the costs of specialist input.			
Groundwater Contamination	Chemical toilets must be installed on site throughout the duration of the construction phase. They should be installed and cleaned once every two weeks by a recognised	Contractors, ECO	Once-off, Monitor bimonthly

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
	temporary sanitation company.		
	Underground services should be designed in such a way so as to require minimum maintenance that would disturb the subsurface environment.	Applicant, Contractors	Once-off
	A walled concrete platform, dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas. Sufficient care must be taken when handling these materials to prevent pollution.	Contractors, ECO	Once – off/ as necessary
	All construction materials liable to spillage are to be stored in appropriate structures with impermeable flooring.		
	Concrete is to be mixed on mixing trays only, not on exposed soil.	Contractors, ECO	Continuous
	Concrete and tar shall be mixed only in areas, which have been specially demarcated for this purpose.		
	All concrete and tar that is spilled outside these areas shall be promptly removed by the Contractor and taken to an approved dumpsite.		
	After all the concrete / tar mixing are complete all waste concrete / tar shall be removed from the batching area and disposed of at an approved dumpsite.		
	In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Environmental Affairs must be informed immediately.	Applicant, Contractors, ECO	As necessary
Access Roads	Existing roads shall be used. The Consulting Engineer in consultation with the ECO shall approve new, temporary and/or access roads. No deviation from approved access roads shall be allowed.	Contractors, ECO	As necessary
	All temporary access roads no longer required, shall be decommissioned, ripped and land rehabilitated to the original land use.		
	Where detailed EMP's that cover specific components of the project have been prepared, the conditions imposed by the relevant EMP are legally binding on the contractor and may be more extensive and explicit than the requirements of this document.		
Dust	Implement a dust suppression program, which should include periodic wetting of the exposed soil surfaces, to prevent the distribution of dust to the surrounding environment.	Contractor, ECO	Once-off
Noise Pollution	Noise levels shall be kept within acceptable limits, and construction crew must abide by local by-laws regarding noise.	Contractor, ECO	Once-off
	Where possible construction work should be undertaken during normal working hours (08H00 –17H00), from Monday to Friday. If necessary special permission can be granted to continue work on Saturdays from 08H00 to 13H00; No work will be allowed on Sundays and Public Holidays.	Contractor, ECO	Continuous

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	The construction crew must abide by the National Noise laws and the local by-laws regarding noise.		
	Should an extension of the upgrading hours be required, the adjacent property Applicant are to be consulted and informed in writing two days in advance of any overtime activities.	Contractors	As necessary
Air Pollution	Construction is to be done as fast as possible without compromising safety and quality of work to limit the time during which dust levels may increase as a result of construction activities.	Contractors	Continuous
	Water is to be used to dampen surfaces and curb dust production should the need arise.	Contractor, ECO	Monitor daily
	Vehicles to be used during the construction phase are to be kept in good working condition and should not be the source of excessive fumes.		
	All materials transported to site must be transported in such a manner that they do not fly or fall off the vehicle. This may necessitate covering or wetting friable materials.		Spot checks daily – weekly
Traffic	The tyres of all vehicles entering the site should be cleaned before entrance to limit the possibility of alien invasive seeds entering the area.	Contractors	As needed
	Existing access routes should not be blocked or impeded by construction. If this is unavoidable, adequate prior planning should be implemented to ensure that safety and access to routes is maintained.	Contractors	As necessary
	Allow for earthmoving vehicles and machinery to access the site outside of peak hours (09h00 – 15h30), if possible.		
	Roads should be kept free of construction debris. Debris, created as a result of construction, should be cleared timeously.		Monitor daily
	Implement a traffic management plan so as to avoid traffic obstruction.	ECO	Once-off
	Ensure that authorisation is obtained for abnormal loads (if required).	Contractors, ECO	As necessary
Heritage resources	Should any archaeological artefact be exposed during excavation, the construction in the vicinity of the findings must be stopped. Under no circumstances shall any artefact be destroyed. Such an archaeological site must be marked and fenced off, and the South African Heritage Resources Agency (SAHRA) must be contacted immediately.	Contractors	As necessary
	Construction personnel must be alert and must inform the Local Council should they come across potentially valuable heritage findings.		
Crime, safety, and security	The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) and the National Building Regulations.		
	Ensure that the handling of equipment and materials is supervised and adequately	Contractor, ECO	Daily

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
	instructed.		
	Limit access to the construction camp only to the workforce. The workforce should wear uniforms or other identification marking so as to be easily identifiable from members of the general public throughout the construction phase.		
	The contractor must supply his own security arrangements for the construction area.	Contractor, ECO	Once-off
Job Creation	Labour employed must include members of the local community.	Contractors	Once-off, as required
	The Applicant must ensure that opportunities will be given to local contractors.	Applicant	Once-off
	Provide pre-development skills training for the temporary and permanent employees	Applicant, Contractor	As required
	Woman must have equal employment opportunities. Salaries of woman must be equal to that of a man doing the same job.	Applicant, contractors	Once-off
Waste Management	Construction solid waste generated during construction should be utilised as fill material as far as possible	Contractor	As necessary
	Surplus solid waste material should be disposed of at a registered waste disposal site	Contractor, ECO	As necessary
Rehabilitation	All topsoil must be appropriately stockpiled and conserved during the construction phase. The topsoil should be inverted when stockpiled to promote the decay of invader/weed species seed.	Contractor, ECO	Monitor daily (ECO=monthly)
	Rehabilitation must include a heterogeneous mixture of native indigenous species, rather than a mono-specific approach. Rehabilitation effort should be directed towards the promotion of a system approach (be functional) rather than a compositional approach.		
	A monitoring programme should be included during and after rehabilitation to ensure proper greening and succession.		
Record Keeping	The Engineer and ECO will continuously monitor the contractor's adherence to the approved impact prevention procedures and shall issue to the contractor a notice of non-compliance whenever transgressions are observed (See Incident Log Sheet Appendix 1).	ECO	Continuous, Report monthly or as necessary
	The non-conformance and remedial action shall be documented and reported by the ECO on the incidence log to the engineer in a monthly report.		
	Repeated non-compliance, after notice has been issued, and sufficient time has been allowed for remedial action, shall be reported to DEA for review.		
Emergencies	Emergency procedures must be produced and communicated to all the employees on site. This will ensure that accidents are responded to appropriately and the impacts thereof are minimised. This will also ensure that potential liabilities and damage to life	Applicant, contractor	Once-off

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ACTIVITY/ ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
	and the environment are avoided.		
	The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.	Applicant, contractor, ECO	Once-off
	The contractor must have a basic spill control kit available at each the construction site. The spill control kits must include absorptive material that can handle all forms of hydrocarbon as well as floating blankets / pillows that can be placed on water courses. The contractor shall ensure that at least the site foreman and ECO have received formal training in the use of the spill control kit.	Applicant, contractor, ECO, site foreman	Once-off

Table 3: Environmental Management Programme for the Operational Phase

ACTIVITY/ISSUE	ACTION	RESPONSIBILITY	FREQUENCY OF ACTION
Site management	A maintenance plan for the road must be developed with regard to maintaining the road surface in order to ensure that it does not deteriorate, have the formation of potholes and become a safety hazard.	Applicant	Once-off
Vegetation	Implement alien invasive plant species removal programme and remove exotic plant species.	Applicant, Contractors	Continuous
Surface water	Prevent aquatic environment and surface water pollution from poor quality water discharges.	Contractors	Contiguous
Erosion, sedimentation and flooding	The site should continually be monitored for the onset of erosion.	Applicant, Contractors	Continuous
	Erosion preventative measures should be implemented upon the onset of erosion.		
	Erosion of road verges and open spaces should be monitored and remediated as soon as possible.		
Job Creation	Employment of local people should be encouraged for the maintenance of the road surface.	Contractors, Applicant	Continuous

8 MONITORING

Compliance with this EMPr must be audited regularly during the construction phase and once immediately following completion of construction. This should be followed up with annual audits (which can form part of the Environmental Performance Assessment as per the requirements of the Minerals and Petroleum Resources Development Act of 2002) thereafter. The continued appropriateness and adequacy of the EMP needs to be evaluated during the audits.

9 ENVIRONMENTAL AWARENESS PLAN

The applicant will ensure that Environmental Management Programme (this document) is made available to the contractor.

The contractor will ensure that the information in this document is explained to the workers on site during all phases of the development.

All workers will attend short induction courses to increase their knowledge base on environmental and health matters.

10 CONCLUSIONS

Provided that mitigation measures are implemented as per this EMPr, the project will result in limited negative environmental impacts. Furthermore, this EMPr should be seen as a dynamic management tool, which should be reviewed, updated and modified as the project progresses and additional impacts are identified. The environmental incident log sheet (Appendix 1) is designed to assist with the site inspections, which will take place continuously during the construction and operational phase.

11 RECOMMENDATIONS

This Environmental Management Programme (EMPr) should be used as an on-site reference document during all phases of this development, and auditing should take place in order to determine compliance with this EMPr. Parties responsible for transgression of this EMPr should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour or negligence should receive penalties.

12 APPENDICES

Appendix 1: Incident Log Sheet

Appendix 2: Complaints Record Sheet

